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QUARTERLY REPORT
Project WP#339: Structural Significance of Mechanical Damage

For Period Ending: November 30, 2010

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Project WP#339: Structural Significance of Mechanical Damage

Background

The primary objective of the project is to establish a detailed experimental database to support the development and validation of improved burst and fatigue strength models for assessing the interaction of mechanical damage with secondary features (gouges, corrosion, and welds). The data will be used to develop and validate mechanistic models which will produce reliable tools to assess a wide range of mechanical damage forms. This will improve safety, reduce unnecessary maintenance, and support the improvement of pipeline standards and codes of practice.

Progress in the Quarter

BMT has completed the initial material characterization of Pipe 3. Based on the results of the initial characterization efforts, they have commenced a more detailed characterization program, intended to fully document the material properties in a manner similar to what was used to characterize the material properties for Pipe 1 and 2.

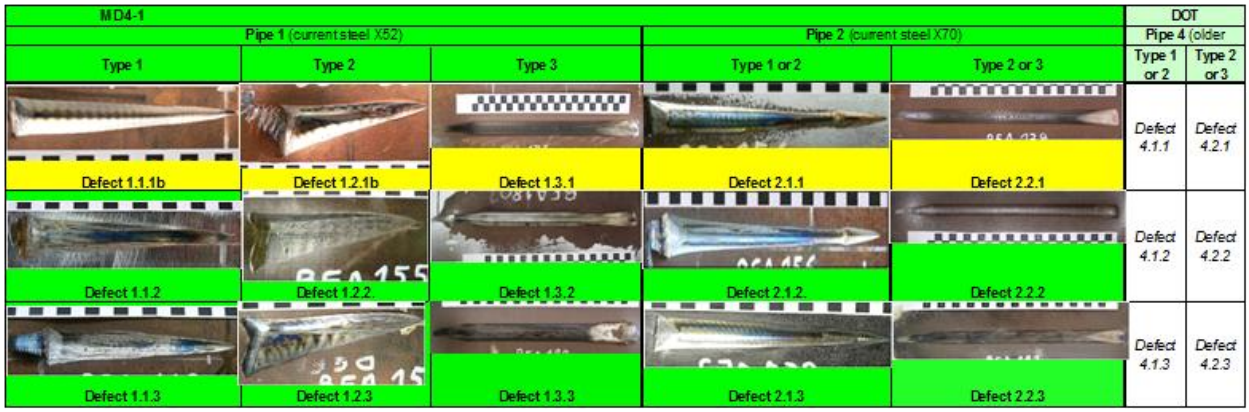
BMT has also begun the full scale dent testing of Pipe 3 specimens beginning with eight plain dent specimens, as summarized in the table below.

Full Scale Vintage Pipe Plain Dent Testing – Initial Phase

Specimen #	Pipe Segment from which to take the specimens	Specimen ID to be recorded on each pipe	Pipe Material	Nominal Indenter Diameter	Indenter Travel/Dent Depth	Dent Restraint	Interacting With	Indentation Pressure	Initial Pressure Cycle	Cyclic Pressure Range	Weld Seam/Indenter Location
				(in)	(%)				(%SMYS)	(%SMYS)	
41	EEE-3	EEE-3-41	C	2	5	R	Plain	0%	100%	10%-80%	NA
42	EEE-10	EEE-10-42	C	4	10	R	Plain	0%	100%	10%-80%	NA
46	EEE-3	EEE-3-46	C	12	5	R	Plain	0%	100%	10%-80%	NA
48	EEE-12	EEE-12-48	C	2	15	U	Plain	0%	100%	10%-80%	NA
52	EEE-10	EEE-10-52	C	4	15	U	Plain	0%	80%	10%-80%	NA
54	EEE-5	EEE-5-54	C	12	15	U	Plain	0%	100%	10%-80%	NA
56	EEE-10	EEE-10-56	C	4	20	U	Plain	0%	100%	10%-80%	NA
57	EEE-5	EEE-5-57	C	12	20	U	Plain	0%	80%	10%-80%	NA

The table below summarizes the progress of the task on “Dent and Gouge” defects for the entire program. The background color in the table represents:

- White: Defects not yet created
- Yellow: Defects already created but not yet investigated or submitted to either Burst or Fatigue tests
- Green: Defects created and tests completed



GDF SUEZ performed a fatigue test on defect 1.3.3 which is a severe "dent + gouge". The pressure range for fatigue tests is higher than the range of bulging pressures. Under these conditions, the test shows that the lifetime of this defect is much higher than the lifetime of a previous similar defect tested in the range of even lower bulging pressures. GDF SUEZ will also proceed to analyze the results of the fatigue test for defect 2.2